## ABSTRACT OF THE DISCLOSURE

The present invention provides animal model systems for cartilage-degenerative disease, which comprise transgenic animals which can express recombinant matrix-degrading enzymes (MDEs), particularly matrix metalloproteinases (MMPs), in a temporally and spatially regulated manner. The invention also provides methods for producing phenotypic indicators of cartilage-degenerative disease in a mammal and methods for determining the potential of a composition to counteract cartilage-degenerative disease. The invention also provides isolated nucleic acids encoding proMMP polypeptides that exhibit constitutive enzymatic activity and isolated proMMP polypeptides.